

Sericulture (Part 2)

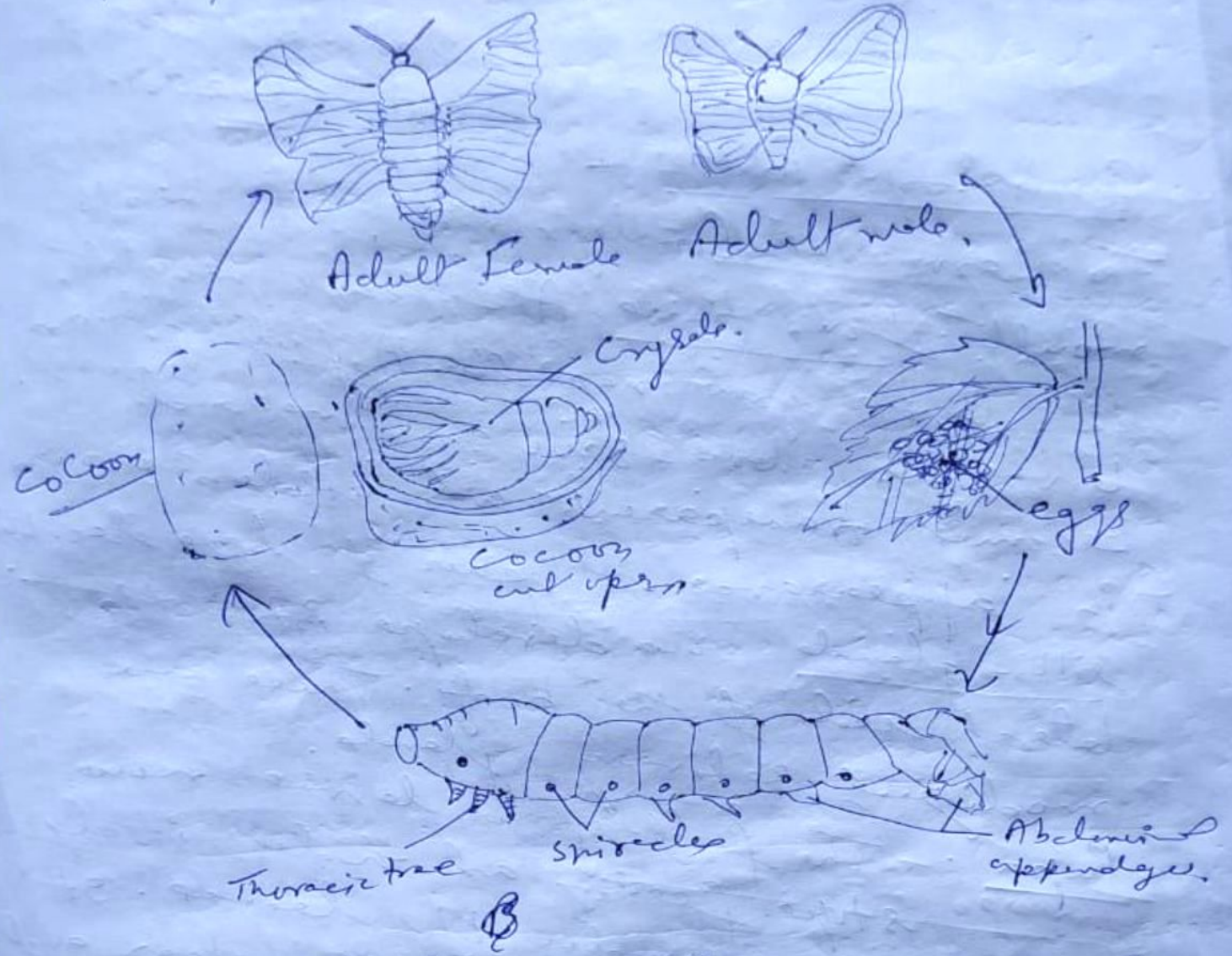
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The larvae of *Bombyx mori*, silk moth, moult four times. After each moult, the larvae grows rapidly. A full-grown larvae is about 8.00 cm long and becomes transparent and golden brown in appearance. A pair of long bee-like silk-glands now develops into the lateral ends of the body. These are modified salivary glands.

Pupa :- The full-grown larvae now stops feeding and hides itself in a corner under the leaves. It now begins to secrete the clear and sticky fluid of its salivary glands through a narrow pore called the spinneret situated on the hypopharynx. The sticky substance turns into a fine, long and solid thread or filament of silk into the air. The thread becomes wrapped around the body of the caterpillar larvae forming a complete

covering or pupal case called the Cocoon. The Cocoon formation takes about 3-4 days. The Cocoon serves a comfortable house for the protection of the caterpillar larvae for further development.



Bombyx mori (Silk worm): life history

The Cocoon is a white or yellow, thick, Oval capsule which is slightly narrow in the middle. It is formed of a single long continuous thread. The Outer threads, which are initial filaments of the Cocoon are irregular, but the inner ones forming later the actual shell of the cocoon are one long continuous thread about

300 meters in length wound round in concentric rings by constant motion of the head from one side to the other about 85 times per minute. The irregular surface threads are secreted first and the inner continuous thread later. The silk thread is secreted at the rate of 150 mm per minute. Within a fortnight the Caterpillar larvae transforms into a Curical brownish creature called the pupa or the Cocoon Crysalis. The pupa lies dormant, but undergoes very important active changes which are referred to as metamorphosis. The larval organs such as abdominal prolegs, and head and mouth parts are lost. The adult organs such as antennae, wings and copulatory apparatus develop. The pupa finally metamorphoses into the imago or adult in about 2-3 weeks time.

Imago or Adult :- The adult moth emerges out through an opening at the end of the cocoon in about 2 to 3 weeks time, if allowed to live. Immediately before emergence, the pupa secretes an alkaline fluid, that softens one end of the cocoon and after breaking it silk strands, a feeble Crampled adult squeezes its way out. Soon after emergence, the adult silkworms mate, lay eggs and die.



Production of Silk :- Now-a-days, production of silk is an important industry of several Asian and European countries, but China and Japan are only great producers of raw silk. No government in this world can profit by its silk-industry except providing employment to half a dozen people per acre of mulberry or part time work to farmers. A rough estimate in India reveals that this industry is providing work to about 5 million people with an annual income amounting to Rs 19 Crores. The total production is about 2.5 million pounds as against a demand of about 4.2 million pounds per year. Sericulture is a regular industry in India and its hot silk-producing centres in Assam, Bengal, Chennai, Punjab, Kashmir and Mysore. Healthy eggs of high yielding strains are procured from sericulture research stations. The hatching of the eggs can be controlled artificially by proper conditions of refrigeration. The eggs are placed in paper-lined trays made of split bamboo. The trays are kept on stools, the legs of which rest in dishes containing water to make them damp proof. The eggs are periodically stirred by a feather.

Larvae are given chopped mulberry leaves 5 to 9 times per day during the larval period which lasts for 3 to 5 weeks in which larvae moult four times.

The pupae are not allowed to become adult. To procure silk, the cocoons, before the emergence of the silk-moths, i.e. 8 to 10 days after the cocoon formation, are dropped in hot water or subjected to steam or dry heat or fumigation. Sometimes they are killed by sunning them for 4-5 days collect stifling. This results in killing the pupae. After according the cocoons with respect to their texture and colour; they are skillfully unwound by experts. Soaking cocoons in boiling water helps in softening the cement or adhesions of silk threads among themselves and in loosening the outer threads to separate freely. After the loose strands have been removed by a revolving brush, free ends from four to five cocoons are passed through eyelets and guides to twist into one thread and wound round a large wheel, from which it is transferred to spools. This is known as raw silk.

The raw silk is again boiled, stretched and treated by acids or by



by fermentation. It is then carefully washed several times to bring about the well known silk lustre on the thread. It is then spun and woven into fabrics which are our most proudly prize.

The waste outer layers or superficial threads and damaged cocoons etc. are combed, teased and then the filaments are spun. This product is known as Spun silk.

One Cocoon yields about 300 metres of silk thread. It requires about 25,000 cocoons to prepare half a kilogram of finished silk. An idea of the total no. of cocoons sacrificed every year for production of silk in India alone about 2 million kilograms of silk and is consumed but production is only 1-15 million kilograms per year. The half of this is produced by Mysore only.